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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/601,946	09/21/2000	Mathias Benz	6110-186STA1	5265

7590 09/04/2002
Perkins Smith & Cohen
One Beacon Street
Boston, MA 02108

EXAMINER

STRICKLAND, JONAS N

ART UNIT	PAPER NUMBER
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1754

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DATE MAILED: 09/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

17-7

Office Action Summary

Application No.

09/601,946

Applicant(s)

BENZ ET AL.

Examiner

Jonas N Strickland

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 18 June 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: See Continuation Sheet.

Continuation of Attachment(s) 6). Other: Copy of Papers Originally Filed.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed on 6/18/02 as Paper No.
6. Claims 1-9 are pending. The Examiner accepts the newly filed drawing correction. The claim objection of claims 4-9 has been withdrawn in view of Applicant's amendment. The 35 U.S.C 112 rejections and 35 U.S.C. 103 rejections of claims 1-3 have also been withdrawn in view of Applicant's amendment.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 3 recites the limitation "for impregnating the M¹ compound" in line 3. There is insufficient antecedent basis for this limitation in the claim.

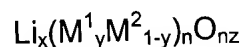
Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yazami et al. (FR 2704216 A1) in view of Von Sacken (US Patent 5,180,574) and Sheargold et al. (US Patent 5,702,679).

Applicant claims a process for preparing lithium transition metallates of the general formula:



The metallate is prepared by calcining an intimate mixture of oxygen-containing transition metal compounds and an oxygen-containing lithium compound, which has been obtained by treating a solid powdered transition metal compound, with a solution of the lithium compound and drying, characterized in that at least the M^1 compound is used in the form of a powder with a specific surface area of at least $10 \text{ m}^2/\text{g}$ (BET) and calcinations is performed in a moving bed.

Yazami et al. discloses electrode materials for rechargeable lithium batteries and their process of synthesis. The compound utilized by Yazami et al. corresponds to the formula $\text{Li}_{ny}(\text{M}_{1-x}\text{M}'_x)_n\text{O}_{nz}$ in which n is 1 or 2, characterized by the fact that M and M' are identical or different and are chosen from the transition metals, by the fact that $0 < x \leq 1$, $0 < y \leq 1$, $1.8 \leq z \leq 2.2$, and by the fact that the compound has a specific surface area is between 1.5 and $50 \text{ m}^2/\text{g}$. The compound in which M and/or M' is chosen from Ti , V , Mn , Cr , Fe , Co , Ni , Zr , Nb , Ta , W , Mo and Re is particularly preferred. Calcining is done in an oxidizing atmosphere. The preparation of the mixture of precursors is done in a liquid medium, then dried, and then calcined. However, Yazami does not disclose calcinations being carried out in a moving bed.

Von Sacken teaches producing lithium mixed metal oxides using rotary calciners and fluid beds, which are moving beds (col. 9, lines 22-26 and col. 13, lines 10-18).

Sheargold et al. teaches a method for producing lithium metal oxides, and wherein rotary kiln's are preferable over stationary beds, because rotary kiln's shorten reaction times and avoid the production of unwanted byproducts (col. 3, lines 58-67 and col. 5, lines 50-54).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yazami et al. to calcine lithium mixed metal oxides in a moving bed, because Von Sacken et al. teaches a process for calcining lithium metal mixed oxides in a moving bed, such as rotary calciners and fluid beds and Sheargold et al. teaches wherein rotary kilns are useful in shortening the reaction time when producing lithium metal oxides. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art would have expected a process for producing lithium metal oxides, which are calcined in moving beds as taught by Von Sacken et al. and Sheargold et al., to be similarly useful and applicable to a process for producing lithium metal mixed oxides, which are calcined by conventional methods, as well as different calcining conditions as disclosed by Yazami et al.

Furthermore, with respect to claims 3 and 4, it would have been obvious to one of ordinary skill in the art to expect the mixed transition metal compound to contain at least some of the M^2 compound in a solution of the lithium compound for impregnating the M^1 compound, because Yazami et al. teaches wherein the transition metal compounds are in a mixed liquid solution. It would have been obvious for some of the

M² compound in a solution of the lithium compound for impregnating the M¹ compound, since Yazami et al. teaches a mixture of transition metals in a lithium solution.

7. Claims 2 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yazami et al. (FR 2704216 A1) in view of Von Sacken (US Patent 5,180,574) and Sheargold et al. (US Patent 5,702,679) as applied to claims 1 and 3-5 above, and further in view of Mao (US Patent 5,728,367).

Applicant claims with respect to claim 2, wherein the transition metallate is milled and sieved after calcinations and the finer fraction from sieving is recycled to the moving bed. The teachings of Yazami et al., Sheargold et al., and Von Sacken have been discussed with respect to claims 1 and 3-5, but these references do not teach the limitations of claim 2, as well as claims 6-9.

However, Mao teaches a method for preparing lithiated transition metal oxides and wherein the materials after heating (calcining) are subjected to a grinding process in a conventional mill (col. 4, lines 61-64). Mao continues to teach that after the milling process that the lithium transition metal oxide by-products may be re-used and reprocessed (col. 5, lines 4-14).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yazami et al., Sheargold et al., and Von Sacken by milling the transition metallate after calcining and recycling the milled transition metallate back to the reaction bed, because Mao teaches after calcining a lithium transition metal oxide, the lithium transition metal oxide is milled and recycled back to the reactor. Such modification would have been obvious to one of ordinary skill in the art, because one

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would expect a process for fabricating lithium transition metal oxides as taught by Mao to be similarly useful and applicable to a process for producing lithium transition metal oxides as taught by Yazami et al., Sheargold et al. and Von Sacken.

With respect to claim 6, Yazami et al. teaches calcining in an oxygen-containing atmosphere. With respect to claim 9, Yazami et al. teaches wherein the transition metal compound spray dried.

With respect to claims 7 and 8, Mao teaches LiNO_3 (col. 6, line 10) and NiOH (col. 4, line 12). Mao also teaches wherein NO_2 is released during calcinations and recovered as nitric acid and reacted with LiOH to give LiNO_3 (col. 5, line 25 – col. 6, line 15).

Response to Arguments

8. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

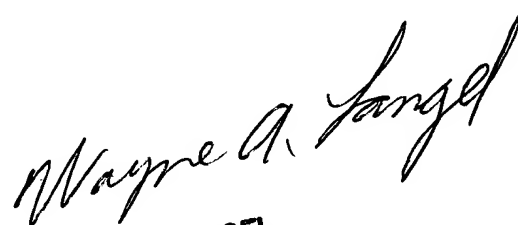
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonas N Strickland whose telephone number is 703-306-5692. The examiner can normally be reached on M-TH. 7:30-5:00, off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0661.



Jonas N. Strickland
August 27, 2002



WAYNE A. LANGEL
PRIMARY EXAMINER